FISHERIES MANAGEMENT AND EVALUATION PLAN

Columbia River Chum Salmon

in Oregon Freshwater Fisheries of the Lower Columbia River Mainstem and Tributaries Between the Pacific Ocean and Bonneville Dam

Prepared by

Oregon Department of Fish and Wildlife
2501 Southwest First Avenue
Portland, Oregon 97201

September, 2003

SUMMARY

This Fisheries Management and Evaluation Plan (FMEP) specifies the future management of recreational and commercial fisheries potentially affecting listed Columbia River chum salmon. Fisheries in Oregon tributaries of the lower Columbia River below Bonneville Dam will be managed to harvest hatchery-origin salmon and steelhead and harvestable surpluses of other species in a manner that does not jeopardize the survival and recovery of listed chum salmon. All tributaries have been closed to the retention of chum salmon since 1992. The retention prohibition will continue. A maximum 2% fishery impact rate is proposed for lower Columbia River tributary fisheries. Ocean and mainstem Columbia River fishery impacts are addressed by other ESA processes although impacts of those fisheries are considered in this FMEP. Columbia River chum are not significantly impacted by ocean fisheries. The mainstem Columbia River fishery impact rate is expected to be less than 2% and will not exceed 5% consistent with the NMFS biological opinion and incidental take statement. A monitoring and evaluation plan will assess the catch, the abundance of chum, and angler compliance with regulations. This information will be used annually to assess whether impacts to listed fish are as expected. Review of the FMEP will occur in 2004 (after 3 years of implementation) and at 5-year intervals thereafter to evaluate whether the objectives of the FMEP are being accomplished.

Title: ***Fishery Management and Evaluation Plan - Columbia River Chum Salmon in Oregon Freshwater Fisheries of the Lower Columbia River Mainstem and Tributaries Between the Pacific Ocean and Bonneville Dam***

Responsible Management Agency:

Agency:	***Oregon Department of Fish and Wildlife***
Primary Contact:	***Steven D. King***
Address:	***2501 S. W. First Ave.***
	Portland, Oregon 97201
Telephone:	***(503) 872-5252 x5391***
Fax Number:	***(503) 872-5632***
Email Address:	**Steve.D.King@state.or.us**

Date Completed: ***Draft: May 17, 2001 (Updated September 2003)***

SECTION 1. FISHERIES MANAGEMENT

1.1) General objectives of the FMEP.

The objective of this Fish Management and Evaluation Plan (FMEP) is to harvest hatchery-origin salmon and steelhead, and harvestable surpluses of other species such as sturgeon in a manner that does not jeopardize the survival and recovery of listed chum salmon in the Columbia River (CR) Evolutionarily Significant Unit (ESU). This FMEP includes all non-Indian freshwater sport and commercial fisheries which affect or could potentially affect Oregon populations of CR chum salmon in the mainstem and Oregon tributaries of the lower Columbia River (LCR). The primary focus is on fisheries that target fall chinook, steelhead, and coho, but this plan also considers the potential of other fisheries to affect this threatened ESU.

1.1.1) List of the "Performance Indicators" for the management objectives.

Performance indicators include fish population indicators by which we assess the status of populations in the listed ESU to determine trends in abundance, risk thresholds, and the impacts of management actions including fisheries. The primary fish population indicators for listed chum salmon are escapement indices based on spawning ground counts in tributaries of the lower Columbia River.

Fishery performance is also monitored to regulate impacts. The primary fishery indicator for CR chum salmon is landings in commercial gillnet fisheries as reported on fish receiving tickets. Commercial fishery age composition and average weight information is obtained by sampling the catch at commercial fish buying stations. Additionally chum caught and released by anglers in the mainstem Columbia are monitored through a statistical sport fishery sampling program.

1.1.2) Description of the relationship and consistency of harvest management with artificial propagation programs.

There is no directed chum harvest and no chum artificial propagation programs within the Oregon portion of the CR chum ESU. Harvest in both mainstem and tributary fisheries is largely designed to access surplus returns of other species destined for hatcheries throughout and upriver of the CR ESU. There are 11 hatcheries in Oregon, and 14 in Washington within the CR chum ESU boundaries. These hatcheries release spring chinook, fall chinook, coho salmon, steelhead, and resident trout. Hatchery chum salmon releases are relatively small and limited to several facilities in Washington.

Hatcheries within the CR ESU are operated by a variety of public and private institutions including U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), and Clatsop County Economic Development Council (CEDC).

Hatcheries within the LCR were built or modernized primarily to mitigate for lost or reduced salmon runs caused by dams in the Columbia River mainstem and tributaries including the Sandy, Little Sandy, Bull Run, and Clackamas rivers. The Select Area Fishery programs are intended to partially mitigate for lost mainstem fishing opportunity as a result of ESA listing of upriver salmon populations.

Hatchery practices have been widely revamped in recent years to address heightened concerns for wild fish populations. Outdated practices included transfer of stocks among hatcheries to meet production goals and outplanting of hatchery fish in or near wild fish production areas. Only a subsample of releases were marked, typically with coded-wire tagged (CWT) to provide information on survival rates, hatchery practices, and fishery contribution.

Hatchery releases are now localized to sites where straying into natural production areas is minimized and fishery opportunities are optimized. Similarly, all releases of catchable trout have also been eliminated in running waters where fisheries might incidentally catch salmonid smolts.

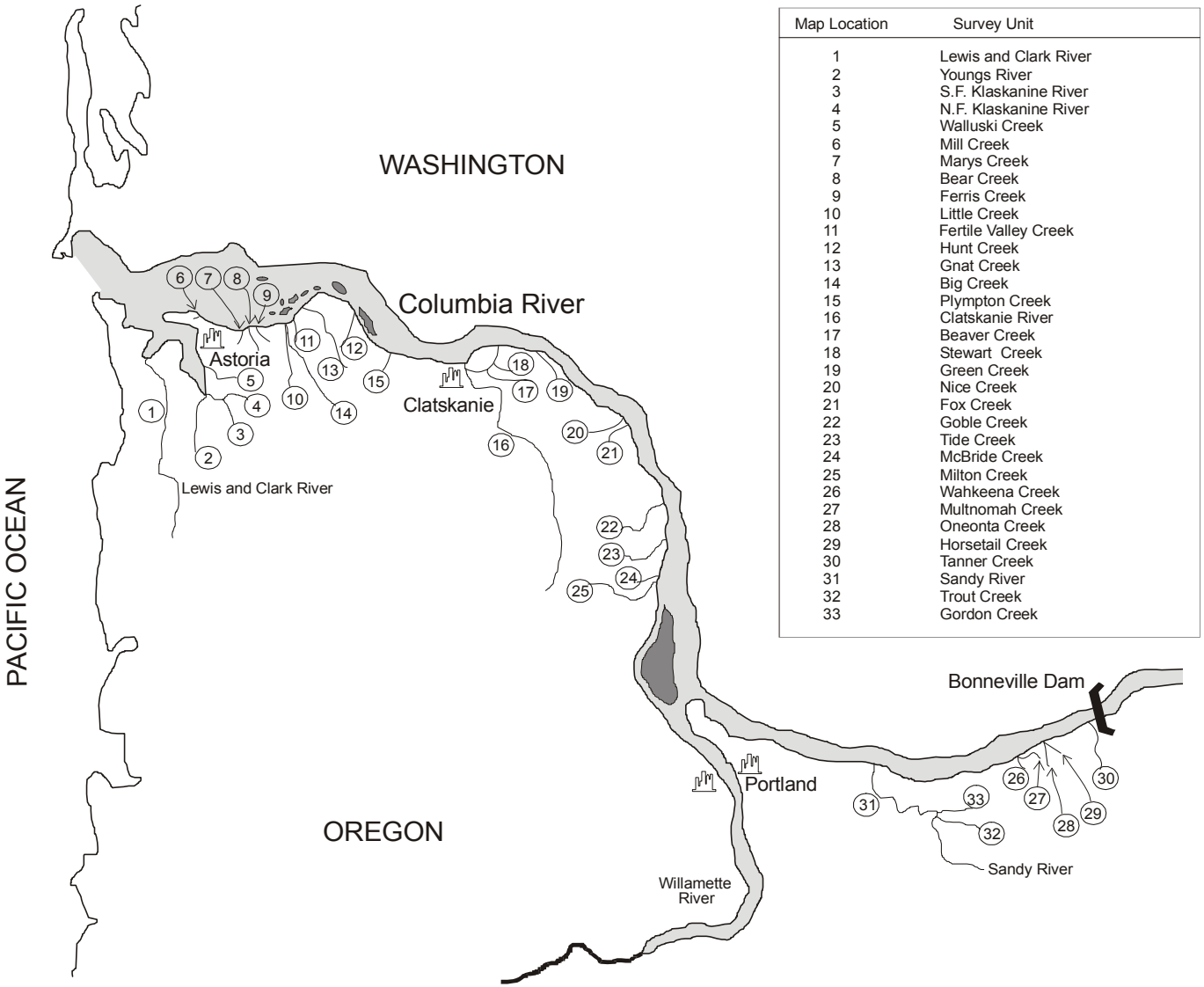
1.1.3) General description of the relationship between the FMEP objectives and Federal tribal trust obligations.

This FMEP describes all fishery impacts on the CR chum ESU so that fishing effects can be accurately assessed. Treaty Indian fisheries occur only above Bonneville Dam and thus have no impact on the CR chum ESU. If tribal fisheries were developed in the CR chum ESU, ODFW would work closely with the tribes to assure that fisheries were consistent with the protection of ESA listed stocks.

1.2) Fishery management area(s).

1.2.1) Description of the geographic boundaries of the management area of this FMEP.

This management plan describes all freshwater fisheries that affect or could potentially affect CR chum salmon in the Columbia River and tributaries downstream from Bonneville Dam (Figure 1). Included are all freshwater fisheries managed under the sole jurisdiction of the state of Oregon occurring within the boundaries of the CR chum ESU including all tributaries to the Columbia River from the mouth upstream to Bonneville Dam. Also included are the chum impacts in LCR mainstem sport and commercial fisheries between the Columbia River mouth and Bonneville Dam. This plan includes an analysis of impacts from both tributary and mainstem Columbia fisheries affecting or potentially affecting CR chum salmon because these fisheries are addressed jointly in management and catch allocation processes and the impacts in one area cannot be considered totally independent of the other. Ocean fisheries and treaty Indian fisheries above Bonneville Dam do not affect listed CR chum and are therefore not considered in this analysis.



Map Location	Survey Unit
1	Lewis and Clark River
2	Youngs River
3	S.F. Klaskanine River
4	N.F. Klaskanine River
5	Walluski Creek
6	Mill Creek
7	Marys Creek
8	Bear Creek
9	Ferris Creek
10	Little Creek
11	Fertile Valley Creek
12	Hunt Creek
13	Gnat Creek
14	Big Creek
15	Plympton Creek
16	Clatskanie River
17	Beaver Creek
18	Stewart Creek
19	Green Creek
20	Nice Creek
21	Fox Creek
22	Goble Creek
23	Tide Creek
24	McBride Creek
25	Milton Creek
26	Wahkeena Creek
27	Multnomah Creek
28	Oneonta Creek
29	Horsetail Creek
30	Tanner Creek
31	Sandy River
32	Trout Creek
33	Gordon Creek

Figure 1. Map of Oregon Lower Columbia River ESU Chum Survey Streams

1.2.2) Description of the time periods in which fisheries occur within the management area.

Fisheries occur within the management area throughout the period of freshwater residence by adult and juvenile CR chum. Adult CR chum return to freshwater during late October through December to spawn. Young emerge in spring and, after a very short freshwater residence, move to the ocean as young of the year fish. After 3 to 5 years at sea, chum mature and return to their home stream completing the life cycle.

Fisheries and time periods are listed in Table 1 and described in more detail below. Sport fishery descriptions and dates are as prescribed in current sport fishing regulations. Commercial fishery descriptions and dates reflect past practice and future expectations.

There are no fisheries that target chum salmon in the CR chum ESU. Chum salmon catch in recreational fisheries has always been minimal and retention in recreational fisheries has been prohibited since 1992. Fisheries targeting chinook and coho occur primarily prior to the peak of the freshwater chum migration, from March through July for spring chinook and August through October for fall chinook and coho. Fisheries targeting steelhead occur year-round. Lower Columbia River commercial salmon fisheries are generally complete by early November, prior to the primary chum migration period of November and December. Large landings of chum salmon occurred historically during November and December, a time that has been largely closed for commercial salmon fishing since the 1950's. No fisheries target juvenile chum salmon due to their short freshwater life history and extremely small size of smolt.

Table 1. Significant fisheries occurring within the lower Columbia River chum management area.

Fishery	Area	Typical open dates	Peak period	Effect[1]
		Sport		
Spring chinook	Lower Columbia R.	Jan 1 – Mar 31 [3]	Mar – Apr	C
	Columbia R. Select Areas	Year-round	Feb – Apr	C
	Lower Sandy R.	Feb 1 – Oct 31 [3]	Apr – June	C
Fall chinook	Lower Columbia R.	Aug 1 – Dec 31 [3]	Aug – Sep	A
	Columbia R. Select Areas	Year-round	Aug – Sep	A
	Clatskanie, Klaskanine, Lewis and Clark, & Youngs R's	Late May – Dec 31	Aug – Sep	A
	Big, Bear, & Upper Gnat Ck's	Late May – Aug 31, Oct 1 – Dec 31	Aug, Oct	A
	Lower Sandy R.	Feb 1 – Oct 31 [3]	Sep – Oct	A
Coho	Lower Columbia R.	Aug 1 – Dec 31 [3]	Aug – Sep	A
	Columbia R. Select Areas	Year-round	Aug – Oct	A
	Klaskanine, Lewis and Clark, & Youngs R's	Aug 1 – Oct 31	Sep – Oct	A
	Big, Bear, & Upper Gnat Ck's	Late May – Aug 31, Oct 1 – 31	Oct	A
	Lower Sandy R.	Sep 1 – Oct 31 [3]	Sep – Oct	A
Winter steelhead	Lower Columbia R.	Aug 1 – Mar 31	Dec – Mar	A
	Clatskanie, Klaskanine, Lewis and Clark, & Youngs R's	Late May – Mar 31	Dec – Mar	A
	Big & Gnat Ck's	Oct 1 – Mar 31	Dec – Mar	A
	Lower Sandy R.	Year-round	Dec – Mar	A
Summer steelhead	Lower Columbia R.	May 16 – Dec 31	May – Aug	A
	Lower Sandy R.	Year-round	Apr – Jul	C
Shad	Lower Columbia R.	Year-round	May – Jul	C
Sturgeon	Lower Columbia R.	Year-round [3]	Year-round	C
Trout	Lower Columbia R.	Jan 1 – Mar 31, Late May-Dec 31	None	C
	LCR Tributaries	Late May-Late October	None	B
	Standing waters	Year-round	Year-round	C[2]
Warmwater species	Lower Columbia River	Year-round	Jun – Aug	C
	Standing waters	Year-round	May – Sep	C[2]
Commercial / Other				
Spring chinook	Lower Columbia River	Determined annually	Feb – Mar	C
	Columbia R. Select Areas	Determined annually	Feb – Jul	C
Fall chinook	Lower Columbia River	Determined annually	Aug – Nov	A
	Columbia R. Select Areas	Determined annually	Jul – Nov	A
Sturgeon	Lower Columbia River	Determined annually	Year-round	A
Smelt	Lower Columbia River	Determined annually	Dec – Mar	C

[1] *A = potential for incidental encounter of CR chum adults, B = limited potential for incidental encounter of CR chum juveniles, C = CR chum not encountered.*

[2] *CR chum not present in system.*

[3] *Regulations sometimes modified based on year-specific expectations and goals.*

Sport spring chinook fishery - lower Columbia River: The spring chinook sport fishery from the Columbia River mouth to the I-5 Bridge is open under permanent regulations from January 1 through March 31. Inseason management actions are taken on an annual basis to either close prior to March 31 or extend into April depending on year specific stock strengths and management agreements. The states of Washington and Oregon individually set regulations concerning sport fisheries in the mainstem Columbia River, although fisheries are normally subject to constraints of annual management agreements under *U.S v. Oregon*. Mainstem Columbia River regulations for the two states are normally identical.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport spring chinook fishery - Columbia River Select Areas: Small sport fisheries for spring chinook occur in "Select Areas" of the lower Columbia River including Youngs Bay, Blind Slough/Knappa Slough, and Tongue Point/South Channel (Figure 2). Select Areas are off-channel bays and sloughs where terminal fisheries are conducted for hatchery salmon which were reared and released from net pens, primarily to provide commercial fishing opportunities. Select areas are open to sport fishing under permanent regulations for the entire year to maximize opportunity on returns from net-pen release programs. The fishery is small (< 1,000 angler trips per year in the spring).

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

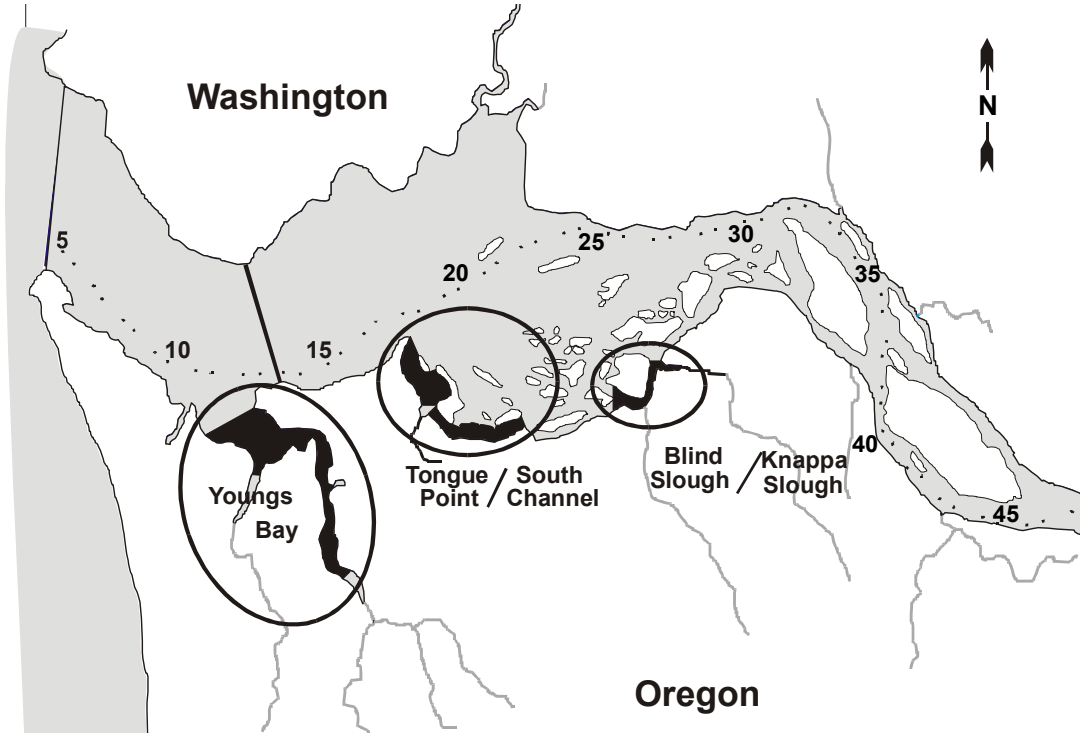


Figure 2. Select Area fishing sites.

Sport spring chinook fishery – Sandy Basin: A fishery for spring chinook salmon occurs in the lower Sandy River from the mouth to Marmot Dam. The chinook fishery is open from February 1 through October 31. The spring chinook fishery downstream from Marmot Dam generally occurs from March through August and peaks in April and May, although spring chinook are occasionally caught as early as February and as late as October.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport fall salmon mainstem fisheries: Significant fisheries for surplus fall chinook and adipose fin-clipped hatchery coho occur in the mainstem Columbia River from August to October. The Buoy 10 fishery normally opens on August 1 in the area between the mouth of the Columbia River upstream to Tongue Point. The fishery is functionally over by early September, although normally there is not a closure of the area. The mainstem sport fishery normally opens August 1 and continues through the end of the year, peaking in late August to early September. This fishery is primarily a chinook fishery, targeted on upriver bright stocks, although significant catches of tule chinook also occur. Catch of adipose fin-clipped hatchery coho and steelhead also occur.

Adult chum salmon begin their freshwater migration at the time that this fishery is nearly complete. Additionally angling from a floating device is prohibited from Beacon Rock upstream to Bonneville Dam November 1 to December 31 to protect naturally spawning chum and chinook salmon. Historic catch estimates for chum during the fall recreational fishery are zero. Chum salmon retention has been prohibited since 1992. Juvenile chum salmon are not present due to their freshwater life history.

Sport fall salmon tributary fisheries: There are no tributary fisheries for chum in the CR chum ESU. There are minor tributary fisheries for chinook in the CR chum ESU however these fisheries are largely complete before November. Significant fisheries for adipose fin-clipped hatchery coho salmon occur in the lower Willamette River, lower Clackamas River, Eagle Creek (Clackamas), and lower Sandy River from September to November of some years. Minor fisheries for adipose fin-clipped hatchery coho salmon occur in the Klaskanine River and Big and Gnat creeks.

Chinook and coho tributary fisheries may encounter chum, but occur too early in the fall to encounter a significant number. Tributary chum handling estimates are unavailable but are likely insignificant. Chum salmon retention has been prohibited since 1992. Juvenile chum salmon are not present due to their freshwater life history.

Sport winter steelhead fisheries: Fisheries for winter steelhead occur from November through May and are restricted to adipose fin-clipped hatchery steelhead. Fisheries occur primarily in the lower reaches and tributaries of the Sandy and Clackamas rivers, although minor fisheries targeting winter steelhead

also occur in lower Columbia Coast Range tributaries such as Big and Gnat creeks, and the Klaskanine River, and the mainstem Columbia River. Fisheries are concentrated from December through March.

Tributary chum handling estimates are unavailable but are likely insignificant. Chum salmon retention has been prohibited since 1992. Juvenile chum salmon are not present due to their freshwater life history.

Sport summer steelhead fisheries: Significant fisheries for adipose fin-clipped hatchery summer steelhead occur in the mainstem Columbia, lower Willamette mainstem, lower Clackamas, and lower Sandy rivers. Summer steelhead are also occasionally caught in the mouths of other small tributaries such as Big Creek. Summer steelhead enter fisheries from March through October and most of the catch occurs from April through August. The Columbia River from the mouth to the I-5 Bridge opens to angling for hatchery steelhead on May 16.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport shad fisheries: Significant shad fisheries occur in the lower Columbia and Willamette rivers from May through July.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport sturgeon fisheries: Significant sturgeon fisheries occur in the lower Columbia and Willamette rivers. The fishery is generally open year-round and legal sturgeon retention sizes are 42 to 60 inches. Sturgeon anglers fish with bait on the bottom and use very large barbless hooks to catch these large fish. In the LCR significant effort occurs year-round. In the lower Willamette River, effort is concentrated from March through June. The sturgeon fishery in the Columbia occurs throughout the river. Most sturgeon fishing in the Willamette River is from boats near Willamette Falls and near the mouth, although a significant bank fishery occurs at Oregon City. Sturgeon fisheries in the Columbia and Willamette are sampled with a statistical creel survey. Angler trips average about 200,000 per year in the lower Columbia mainstem and 6,000 per year in the lower Willamette River. Chum impacts in sturgeon fisheries are zero.

Sport trout fisheries: Fisheries for trout occur in tributaries and standing waters throughout the LCR and lower Willamette Basin. Within the CR ESU, plants of hatchery-reared trout for put-and-take fisheries are restricted to standing waters and streams without anadromous fish to avoid impacts on steelhead and salmon smolts. Many of these out-plants and fisheries now occur above or in the same reservoirs where dams block historic salmon migrations. Trout fisheries occurring in waters containing CR chum have a late May opener (May 25 in 2001) to protect anadromous outmigrants.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport warmwater fisheries: Significant fisheries occur in the Columbia River mainstem, Multnomah Channel, Willamette River mainstem, and lower sections of some large tributaries for warmwater game species including largemouth bass, smallmouth bass, channel catfish, crappie, bluegill, and walleye. Warmwater fisheries also occur in standing waters throughout the basin. In the Columbia River, warmwater fisheries focus on off-channel, near-shore, and deep-water benthic areas where juvenile salmonids are not common. In the Willamette River and its tributaries, warmwater fisheries are concentrated in backwaters and sloughs which are not hospitable rearing areas for juvenile salmonids. Chum are not present in standing waters where warmwater fisheries occur. Fisheries are also most active during warm summer months. Since warmwater species potentially prey on and compete with juvenile chum, warmwater fisheries could actually provide some marginal benefit for listed chum if the warmwater catch were significant.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Sport smelt fisheries: Smelt rarely appear in Oregon tributaries, but significant runs have occurred in the Sandy River on occasion. Smelt runs normally occur in winter or early spring, and are short lived. Sport smelt fisheries are open in the lower reaches of most LCR tributaries, and in the entire Sandy Basin.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history.

Commercial spring chinook fisheries: Winter commercial salmon fisheries occur from the Columbia River mouth upstream to Kelley Point near the mouth of the Willamette River. These fisheries currently target an allocation of Willamette hatchery stock spring chinook and are constrained by limitations on impacts to listed upriver spring chinook stocks. Since 1968, the general management time frame for the winter season has been February 15 to March 10. The gear has been restricted to an 8-inch minimum mesh size to avoid incidental handle of winter steelhead. Experimental fisheries using tangle (tooth) nets occurred beginning in 2001. This gear is designed to allow selective harvest of hatchery fish while minimizing mortality of released (e.g., unmarked) fish, which could allow additional harvest of hatchery fish while reducing impacts to listed fish.

Adult chum salmon are not present during this time. Juvenile chum salmon may be present but are not likely impacted due to their small size and freshwater life history. These fisheries are covered under separate mainstem Columbia River section 7 consultations.

Commercial fall salmon fisheries: Fall commercial salmon fisheries occur from the Columbia River mouth upstream to Beacon Rock. These fisheries are crafted to target surplus stocks of chinook and coho, and have very specific time, area, and gear restrictions to limit impacts to non-target stocks and species. Recent fisheries have consisted of an August 2S (an area approximately 20 miles upstream from the Sandy River) chinook fishery, a late September 2S chinook fishery, a late September coho fishery, and an October coho fishery. The 2S fisheries target on upriver bright stocks while minimizing impacts on tule stocks. They are typically large mesh (8 or 9 inch minimum) night-time fisheries that run for 1-4 consecutive nights. The September and October coho fisheries target early and late stock coho, respectively, using small mesh (6 inch maximum) floating gillnets to minimize chinook impacts. In past years when large hatchery tule stock surpluses were present, commercial fisheries occurred in the estuary or river wide near the peak of the tule migration in late August or early September.

Adult chum salmon begin entering freshwater in late October as fall commercial fisheries are near completion and are afforded protection through time, area, and gear restrictions. Juvenile chum salmon are not present due to their freshwater life history. These fisheries are covered under separate mainstem Columbia River section 7 consultations.

Commercial chinook and coho fishery - Select Areas. These gillnet fisheries in off-channel areas of the lower Columbia River mainstem target hatchery chinook and coho which have been reared and released from a cooperative county, state, and industry net-pen program with a goal of 100% harvest of returning adults. Winter and spring fisheries are for Willamette hatchery stock spring chinook. Summer fisheries are primarily for early-returning SAB fall chinook but can include late arriving spring chinook. Fall fisheries are primarily for coho, but also SAB (Youngs Bay) and lower river hatchery tule chinook (Big Creek) if there are projected surpluses. Fisheries occur in Youngs Bay, Tongue Point, and Blind Slough during spring, Youngs Bay during summer, and Youngs Bay, Big Creek, Tongue Point/South Channel, and Blind Slough/Knappa Slough during fall (Figure 2).

Adult chum salmon begin entering freshwater in late October as fall Select Area fisheries are near completion. Juvenile chum salmon may be present during spring Select Area fisheries but are not likely impacted due to their small size and freshwater life history. These fisheries are covered under separate mainstem Columbia River section 7 consultations.

Commercial sturgeon fisheries: The winter commercial sturgeon fishery occurs in January and February between the Columbia River mouth and Beacon Rock. Gillnet mesh size is restricted to 9-inch minimum and 9 3/4-inch maximum to avoid non-legal sized sturgeon and other species including spring chinook and winter steelhead. Fishing periods during January and February provide commercial access to a harvestable sturgeon population with minimal impact on salmonids.

Adult and juvenile chum salmon are not present during this time.

Fall commercial sturgeon fisheries occur between August and November with 9-inch minimum and 9¾-inch maximum mesh size restriction in place. Dates and areas are selected to maximize the ratio of sturgeon to salmon in the catch. In recent years, these fisheries have consisted of a one-night fishery downstream from Longview Bridge in the first week of August, and several periods in October and early November downstream from Beacon Rock.

Adult chum salmon begin freshwater migration in late October and are afforded additional protection through gear regulations and time and area closures. Juvenile chum salmon are not present due to their freshwater life history.

Commercial smelt fisheries: Under permanent regulations, the commercial smelt fishery operates seven days per week from December 1 through March 31. However, the season has been reduced or replaced with a test fishery since 1995 because of recent poor returns. The fishery occurs in the lower mainstem Columbia River and Washington tributaries. Gear includes small otter trawls, gillnets with a maximum of two-inch mesh size, and hand dip nets.

This fishery does not affect chum salmon adults or juveniles. The few adult chum present during this time easily avoid the gear. Juvenile chum are not present due to their freshwater life history.

1.3) Listed salmon and steelhead affected within the Fishery Management Area specified in section 1.2.

This plan considers fishery impacts solely on Oregon populations of Columbia River chum which were listed as threatened effective May 24, 1999. Other listed salmon and steelhead present in the CR chum ESU management area include upper Willamette River spring chinook (threatened effective May 24, 1999), upper Willamette River steelhead (threatened effective May 24, 1999), lower Columbia River steelhead (threatened effective May 18, 1998), lower Columbia River chinook (threatened effective May 24, 1999), Snake River spring/summer chinook (threatened effective May 22, 1992), Snake River fall chinook (threatened effective May 22, 1992), Snake River sockeye (endangered effective December 20, 1991), Snake River steelhead (threatened effective May 18, 1998), upper Columbia River steelhead (endangered effective May 18, 1998), upper Columbia spring chinook (endangered effective May 24, 1999), and mid-Columbia River steelhead (threatened effective May 24, 1999). Fishery impacts on other listed stocks are addressed by other plans or consultation processes. For instance, fishery impacts on listed upper Willamette River chinook, upper Willamette River steelhead, lower Columbia River steelhead, lower Columbia River chinook, mid-Columbia River steelhead, and Snake River steelhead are considered in separate Fish Management and Evaluation Plans prepared by the Oregon Department of Fish and Wildlife.

The Columbia River chum ESU includes all naturally-spawning populations residing below impassible natural barriers from the mouth of the Columbia River to Bonneville Dam.

1.3.1) Description of "critical" and "viable" thresholds for each population (or management unit) consistent with the concepts in the document "Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units."

NMFS defines population performance in terms of abundance, productivity, spatial structure, and diversity and provides guidelines for each (McElhany et al. 2000). Abundance guidelines include critical and viable population thresholds. Critical thresholds are those below which populations are at relatively high risk of extinction. Critical population size guidelines are reached if a population is low enough to be subject to risks from: (1) depensatory processes, (2) genetic effects of inbreeding depression or fixation of deleterious mutations, (3) demographic stochasticity, or (4) uncertainty in status evaluations. If a population meets one critical threshold, it would be considered to be at a critically low level. Viability thresholds are those above which populations have negligible risk of extinction due to local factors. Viable population size guidelines are reached when a population is large enough to: (1) survive normal environmental variation, (2) allow compensatory processes to provide resilience to perturbation, (3) maintain genetic diversity, (4) provide important ecological functions, and (5) not risk effects of uncertainty in status evaluations. A population must meet all viability population guidelines to be considered viable.

Productivity or population growth rate guidelines are reached when a population's productivity is such that: (1) abundance can be maintained above the viable level, (2) viability is independent of hatchery subsidy, (3) viability is maintained even during poor ocean conditions, (4) declines in abundance are not sustained, (5) life history traits are not in flux, and (6) conclusions are independent of uncertainty in parameter estimates. Spatial structure guidelines are reached when: (1) number of habitat patches is stable or increasing, (2) stray rates are stable, (3) marginally suitable habitat patches are preserved, (4) refuge source populations are preserved, and (5) uncertainty is taken into account. Diversity guidelines are reached when: (1) variation in life history, morphological, and genetic traits is maintained, (2) natural dispersal processes are maintained, (3) ecological variation is maintained, and (4) effects of uncertainty are considered.

This fishery management plan focuses primarily on abundance, which is the key performance feature most directly affected by fishery impacts of the scale we propose. Moreover, assessing Oregon CR chum productivity is not feasible due to extremely limited spawning ground survey data with almost no observed spawners. Listed Oregon CR chum would clearly not meet spatial structure and diversity guidelines for population viability defined by the NMFS because of a limited number of wild populations and extremely low population size. However, spatial structure and diversity guidelines will not be achieved by further reductions in fisheries which affect these chum populations. Spatial structure and diversity guidelines must be addressed by habitat restoration measures. Spatial structure and diversity of wild salmon populations can be affected by high fishing rates but the effects of fishing rates identified in this plan are expected to be insignificant. The fishery impact rates proposed also will not reduce population sizes to levels where spatial effects are exacerbated. The proposed fishery impact rates on CR chum are not expected to exert sufficient selection pressure on any

single characteristic to affect diversity. See section 2.1.2 for a more detailed discussion of why the harvest regime is not likely to result in changes to biological characteristics of the affected ESU.

The ODFW considers a critical abundance threshold as at least 300 spawners per year per population or management unit as defined by Oregon State Wild Fish Management and Wild Fish Gene Resource Conservation Policies (OAR 635-07-52 and OAR 635-07-538). This threshold is consistent with our review of the conservation biology literature and discussions in McElhany et al. (2000). The NMFS provides limited guidance on fish numbers corresponding to critical and viability abundance thresholds. They discuss hypothetical risks related to genetic processes effective at annual spawning population ranging from 50 to several thousand individuals. Spawner numbers of 300 or greater appear sufficient to avoid detrimental short-term genetic effects. Due to the severely depressed status of Oregon CR chum and little or no historic chum data for this portion of the ESU we have not defined a specific critical threshold for this population.

Definition of an appropriate viability threshold depends largely on the capacity and productivity of the available habitat and the corresponding population size where compensatory population processes begin to provide resilience. Population size, habitat capacity, and productivity are unavailable for Oregon CR chum salmon populations thus a viable population size has not been defined.

1.3.2) Description of the current status of each population (or management unit) relative to its "Viable Salmonid Population thresholds" described above. Include abundance and/or escapement estimates for as many years as possible.

We did not establish "Viable Salmonid Population (VSP) thresholds" for CR chum salmon due to the extremely limited data regarding spawning chum in the Oregon portion of the ESU. The ODFW began comprehensive spawning ground surveys for chum salmon in 2000 and is currently compiling the limited historic data that is available. It is our intent to work closely with the NMFS' Technical Recovery Team (TRT) to develop "VSP thresholds" for the Oregon portion of the CR chum ESU. ODFW has proposed interim harvest rates as NMFS has done for listed steelhead and salmon populations that are caught in the Pacific Salmon Treaty and the Pacific Fishery Management Council areas. Abundance and escapement estimates for Oregon CR chum are unavailable. Expanded spawning ground surveys were initiated in 2000 with only one chum salmon observed (Muldoon et al.). The ODFW considers CR chum populations to be "very depressed to extinct" due to habitat conditions that are poorly suited to the natural production of chum (Kostow 1995).

1.4) Harvest Regime

This FMEP primarily addresses fisheries within Oregon tributaries of the CR chum ESU that target on spring and fall chinook, winter steelhead, and coho, although impacts from other fisheries are considered. A primary goal of management conducted by ODFW is to limit combined ocean and freshwater fishery impacts at or below levels which preserve and recover wild fish populations. Fisheries for chum within the mainstem and

tributaries have been closed to chum retention since 1992 and historic recreational harvest was likely extremely limited. Management of fisheries for species other than chum including chinook, coho, steelhead, trout, shad, and warmwater fisheries has been tailored to minimize impacts on chum adults and juveniles. Moreover, many releases of hatchery chinook, coho, steelhead, and trout have been modified or discontinued which further limits potential fishery conflicts with listed adults and smolts.

1.4.1) Provide escapement objectives and/or maximum exploitation rates for each population (or management unit) based on its status.

Until VSP levels are established for CR chum, ODFW has proposed interim maximum exploitation rates for tributary fisheries. Due to concerns about extremely low spawner abundance, ODFW has eliminated the direct harvest of chum salmon in mainstem and tributary recreational fisheries through regulations that require anglers to release all chum salmon. Additionally ODFW, in conjunction with WDFW through the Columbia River Compact, has used time and area closures to establish sanctuaries which are closed to commercial fishing to protect CR chum.

There are no data available to determine appropriate harvest rates for chum salmon in the LCR. In a meta-population analysis, Myers et al. (1999) indicated Ricker ln(α) values were around 1.3 for chum at low population sizes. Since sustainable exploitation rates are only dependent on the Ricker α parameter, the proposed harvest rates for Puget Sound summer chum applied to CR chum salmon would be consistent with recovery. The NMFS has suggested an 8.3% harvest rate was appropriate for listed Puget Sound summer chum salmon (NMFS 2000a). We propose a maximum 2% fishery impact rate on chum salmon in LCR tributary fisheries.

1.4.2) Description of how the fisheries will be managed to conserve the weakest population or management unit.

All LCR mainstem and tributary areas are closed to the retention of chum salmon. Most of these fisheries are also closed during the migration of smolts from tributaries and require the release of all salmonids smaller than 8 inches in length.

1.4.3) Demonstrate that the harvest regime is consistent with the conservation and recovery of commingled natural-origin populations in areas where artificially propagated fish predominate.

ODFW has closed all tributaries to the harvest of chum salmon. Juvenile chum salmon are not intercepted in fisheries because of restrictive trout fishery regulations and because their small size and freshwater life history does not allow them to recruit to resident fisheries.

1.5) Annual Implementation of the Fisheries

The coordination and integration of numerous fora and processes are required to implement fisheries consistent with conservation and use goals. This FMEP represents one of those processes, and as such must account for impacts from other fisheries.

Ocean Processes: Ocean harvest management takes place in the Pacific Fishery Management Council and Pacific Salmon Treaty fora. Ocean and inriver fishery allocation decisions are closely related and implemented in an annual process. ESA coverage for ocean fisheries normally takes place through Section 7 consultation.

Columbia River Processes: The process for setting in-basin fisheries is closely related and concurrent with the process for establishing sport and commercial seasons in the lower Columbia River. Commercial seasons in concurrent Oregon and Washington waters of the Columbia River are regulated by a joint Oregon and Washington regulatory body (the Columbia River Compact) in a series of public hearings which begin in January for winter and spring fisheries, and in August for fall fisheries. The ODFW and WDFW directors or their delegates comprise the Compact and act consistent with delegated authority by the respective state commissions. Sport seasons in concurrent waters are adopted by the individual states, but great effort is expended to ensure a coordinated process occurs between Oregon and Washington which results in consistent regulations.

Columbia River seasons are also regulated by the *U. S. v. Oregon* process which dictates sharing of Columbia River fish runs between Indian and non-Indian fisheries. Mainstem Columbia River harvest management is normally based on annual agreements between the parties to *U. S. v. Oregon* and implemented though the Columbia River Compact. ESA coverage for mainstem Columbia River and ocean fisheries normally takes place through Section 7 consultation. Because the Section 7 process is an annual process in many cases, it is important that harvest levels in this FMEP are considered as part of those processes as well.

Permanent Regulation Process: Specific fishery regulations consistent with OFWC goals and objectives are based on a quadrennial angling regulation review process that includes ODFW staff and public input. This process addresses regulations for all fisheries addressed by this FMEP (salmon, trout, warmwater, shad, sturgeon, smelt, etc.). Permanent rules are developed in a state-wide angling regulation process which is currently conducted at 4-year intervals. A 1996 public involvement process established angling regulations from 1997 through 2000. The public process for 2001 through 2004 regulations began in September 1999 and was completed in 2000. The public process involved (1) solicitation of proposals for regulation changes from ODFW staff, Oregon State Police (OSP), and the public, (2) categorization of proposals for substance and opportunity by a Regulation Review Board which includes representatives from the public, ODFW, OSP, OFWC, and the Oregon Governor's office, (3) review of proposals in a series of 7 public meetings held around the state, and (4) review and adoption of rules by the OFWC at public commission meetings in August and September 2000. New sport regulation pamphlets were prepared and printed in October and November 2000 and new regulations took effect on February 1, 2001.

There is also a process in place to implement regulations on a much shorter time schedule than every four years that addresses emergency conditions. These emergency regulations can be adopted by the Commission within 2 weeks if a Commission meeting is scheduled near the same date. The Commission has also delegated to the Director of ODFW the authority to adopt emergency regulations. If the Director adopts emergency regulations, they can be implemented within a matter of days from the time they are submitted. ODFW will consult with NMFS regarding the proposed regulations changes prior to

implementation to ensure that effects on listed CR chum salmon will be consistent with limitations described in this FMEP.

.

SECTION 2. EFFECTS ON ESA-LISTED SALMONIDS

2.1) Description of the biologically-based rationale demonstrating that the fisheries management strategies will not appreciably reduce the likelihood of survival and recovery of the affected ESU(s) in the wild.

Population Viability Analysis (PVA) is a widely applied and useful conservation assessment tool for evaluating specific harvest actions where used in conjunction with a Viable Salmonid Population concept as described by the NMFS to identify abundance levels necessary for long-term survival (Burgman 1993, McElhany et al. 2000). Total escapement and harvest estimates are not available for CR chum and without these it was not possible to perform a formal PVA and establish an explicit recovery exploitation rate. Although no explicit recovery exploitation rate was identified for CR chum, we used the rate derived for Hood Canal summer chum salmon. This rate is well below the harvest rates that would be derived if we used data from a meta-population analysis, which included chum salmon by Myers et al. (1999). Fishing rates identified in this plan do not appreciably reduce the likelihood of survival and recovery of CR chum salmon.

2.1.1) Description of which fisheries affect each population (or management unit).

Fishery affects on the CR chum populations are minimal due to the previously mentioned factors including life history characteristics, complete closure of recreational chum fisheries, and time/area restrictions on the lower Columbia commercial gillnet fishery. Table 1 displays all fisheries occurring in the Oregon portion of the Columbia River chum management area and characterizes their potential effect on the population.

2.1.2) Assessment of how the harvest regime will not likely result in changes to the biological characteristics of the affected ESUs.

Extremely low harvest rates are the result of the forementioned fishery restrictions. This management regime has substantially reduced the potential for fishing-related changes in biological characteristics of CR chum. In addition, low fishing rates for chum will result in increased numbers of spawners even in periods of poor freshwater migration and ocean survival conditions. Larger populations will be less subject to genetic risks and loss of diversity associated with small population sizes.

Fishing impact rates for all management units are spread over the breadth of the run so that no subcomponent of the population will be selectively harvested at a rate substantially larger than any other portion of the run. No significant harvest differential will occur for different size, age, or timed portion of the run.

2.1.3) Comparison of harvest impacts in previous years and the harvest impacts anticipated to occur under the harvest regime in this FMEP.

Since 1992, ODFW has closed all recreational fisheries in the CR chum ESU to the retention of chum salmon. Current chum salmon interception rates are believed to be much less than 5%. Assuming a catch and release mortality of 10%, the tributary sport fishing mortality rate has been less than 1% from 1992 to the present and is expected to continue at this very low level.

The vast majority of historic chum salmon impacts occurred in the mainstem commercial gillnet fishery during November and December. Gillnet fisheries during November and December were largely eliminated during the 1950's. From the 1960's through the 1980's, commercial gillnet fisheries typically ended around November 15. Since 1990, commercial salmon gillnet fisheries during early November have been eliminated to protect late returning wild LCR coho and CR chum salmon (ODFW and WDFW 2000). The expected harvest rate in mainstem Columbia fisheries is less than 2% and will not exceed 5% consistent with the NMFS biological opinion and incidental take statement (ODFW and WDFW 2001).

Additional reductions in CR chum salmon fishery impacts are not possible without considerable reductions of fisheries directed at surplus hatchery stocks.

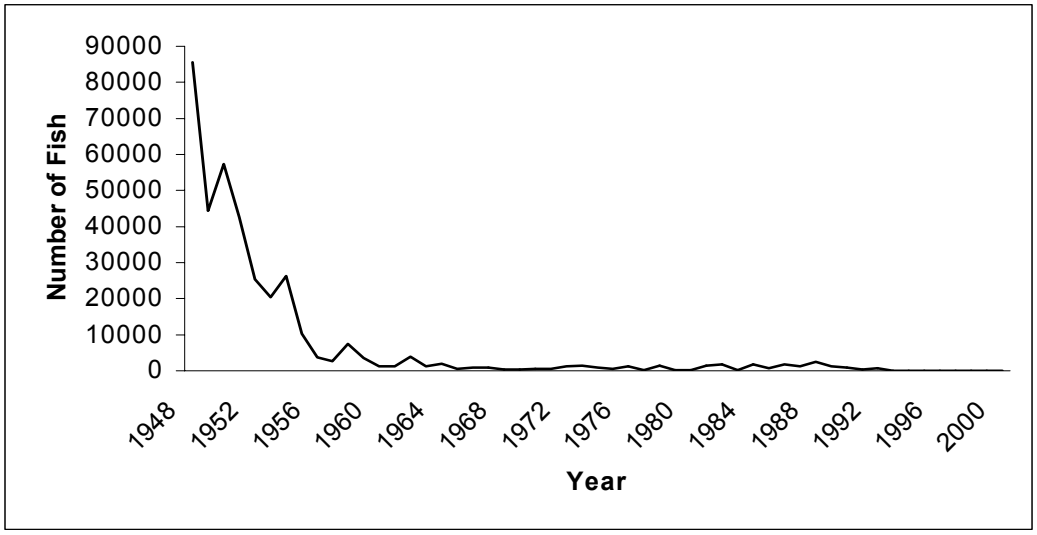


Figure 3. Commercial Landings of Chum Salmon from the Columbia River, 1948-2000.

2.1.4) Description of additional fishery impacts not addressed within this FMEP for the listed ESUs specified in section 1.3. Account for harvest impacts in previous year and the impacts expected in the future.

Columbia River chum salmon are not caught in measurable numbers in ocean salmon fisheries off the Washington, Oregon, and California coast managed by the PFMC (NMFS 2000b). There are fisheries directed at chum in Puget Sound and in Canada and Alaska that generally target maturing fish returning to nearby terminal areas in the fall. There is very little specific information on the ocean distribution of Columbia River chum, but given the timing and distant location of fisheries directed at chum, it is unlikely that Columbia River chum are significantly affected by ocean fisheries (NMFS 2000a).

The Columbia River historically contained large runs of chum salmon that supported a substantial commercial fishery during the first half of this century. Commercial landings represented a harvest of a half million chum salmon during some years (Johnson et al. 1997). By 1955, landings had diminished to 10,000 fish. Since 1965, landings have averaged less than 2,000 fish annually. Commercial landings from 1993-2000 averaged 34 fish annually (Figure 3). Presently, no commercial fisheries are directed at Columbia River chum salmon. Chum landings only occur as incidental to targeted coho seasons during the late fall gillnet fishery. The most recent Columbia River fishery biological opinion limited chum salmon harvest rates to less than 5% (NMFS 2000b). However, the projected harvest was estimated to be less than 2%.

SECTION 3. MONITORING AND EVALUATION

3.1) Description of the specific monitoring of the "Performance Indicators" listed in section 1.1.1.

Performance indicators for Oregon CR chum include fish population indicators and fishery indicators. A spawning ground survey program for Oregon CR chum was initiated by ODFW in 2000 with the goal of providing an index of population size. This index is expressed as peak spawners per mile in standard survey units. Historic data of this nature are unavailable or very limited and is currently being compiled and summarized.

The primary fishery indicator for CR chum salmon is catch estimates from the commercial gillnet fisheries in the mainstem Columbia River and Select Areas. Commercial fishery landings are estimated inseason by contacting wholesale buyers regarding their purchases. The number of active buyers is small and all are contacted for daily accounting of the catch. Landings are verified post-season from fish landing tickets. All fish buyers are required to complete and return fish receiving tickets for all purchases as a condition of their license. The commercial catch is subsampled inseason at fish buying sites to gather biological data including CWTs. Mainstem and Select Area commercial fisheries for salmon and sturgeon are sampled at a minimum 20% rate. Additional fishery indicators are available for recreational fisheries in the mainstem Columbia River and Select Areas where formal creel census programs are conducted. During formal creel census, anglers are interviewed at dockside or while fishing. All catch, kept and released, is recorded and subsequently expanded based on various algorithims specific to the survey location, length of day, angling method, etc. Recreational catch estimates for tributaries not covered by formal creel census are unavailable from angler returned catch record cards due to the prohibition on chum salmon retention.

3.2) Description of other monitoring and evaluation not included in the Performance Indicators (section 3.1) which provides additional information useful for fisheries management.

In addition to routine monitoring and evaluation activities described above, the ODFW also collects or uses information from a variety of sources related to the status of listed species and the implementation of fisheries which might affect them. Chum salmon are documented while ODFW conducts routine spawning ground surveys at numerous index sites for lower Columbia River coho and chinook. Extensive habitat monitoring

and evaluation is conducted in association with the Oregon Plan for Salmon and Watersheds, Oregon Forest Practices Act, and routine environmental protective activities relative to USACE fill and removal permitting.

3.3) Public Outreach

The ODFW conducts extensive public involvement and outreach activities related to salmon fishery management and recovery. The annual fishery regulation process involving a series of public meetings, information mailouts, press releases, and public hearings was described in detail in section 1.5. Anglers are keenly aware of and accustomed to abrupt inseason management changes including closures and reopenings with short notice. Permanent regulations are detailed in published pamphlets of fishing regulations. Annual regulation and inseason changes are widely publicized with press releases, phone calls or faxes of action notices to key constituents, and signs posted at fishery access points. The ODFW also operates an information line, a tape-recorded hotline, and an Internet web page where timely information is available.

3.4) Enforcement

Sport fishing regulations in Oregon are enforced by the Fish and Wildlife Division of the Oregon State Police working in close partnership with the Oregon Department of Fish and Wildlife. The OSP and ODFW work together to develop enforceable regulations to achieve fish and wildlife resource management goals. The Fish and Wildlife Enforcement Division of the OSP currently includes 128 Supervisors and Troopers including 105 assigned to general fish, wildlife, and natural resources law enforcement, and 13 Troopers assigned specifically to protection of anadromous fish and their habitat under the "Oregon Plan for Salmon and Watersheds." Another 6 Troopers are assigned to commercial fish enforcement. Permanent staff are also supplemented with cadets. Enforcement activities in the CR chum ESU are conducted from offices in Astoria, Scappoose, and Portland.

ODFW and OSP work together to facilitate enforcement of resource management goals through an annual cooperative enforcement planning process where local Troopers meet yearly with local biologists to set enforcement priorities by species. Troopers then develop tactical plans to address priority issues and gain desired compliance levels to protect resources and meet management goals. The results of each tactical plan are quantified and compared to the compliance level considered necessary to meet management goals. Compliance is typically estimated based on the percentage of angler contacts where no violations are noted. Tactical plans are adjusted if necessary based on compliance assessments to make the best use of limited resources in manpower and equipment to achieve the goals.

3.5) Schedule and process for reviewing and modifying fisheries management.

3.5.1) Description of the process and schedule that will be used on a regular basis (e.g. annually) to evaluate the fisheries, and revise management assumptions and targets if necessary.

To ensure that fish populations and fishery management are meeting the goals described in this plan, annual monitoring will include wild fish escapement numbers and/or indices, fishery harvest, and projected fishery impacts on wild

fish. This information will be provided to NMFS' Hatcheries and Inland Fisheries Branch in Portland, Oregon, by March 31st of each year the FMEP is in effect.

Additional restrictions in mainstem Columbia River fisheries may also be implemented. Fishery restrictions may involve a combination of time and area closures as necessary. Sport fishery restrictions would be regulated as part of the annual review process for permanent regulations, or through emergency action by the ODFW and the OFWC. Mainstem commercial fishery restrictions would occur in the Columbia River Compact forum as part of the normal inseason management process. ODFW will consult with NMFS regarding the proposed regulations changes prior to implementation to ensure that effects on listed CR chum salmon will be consistent with limitations described in this FMEP.

3.5.2) Description of the process and schedule that will occur to evaluate whether the FMEP is accomplishing the stated objectives. The conditions under which revisions to the FMEP will be made and how the revisions will likely be accomplished should be included.

This FMEP is intended to remain in effect indefinitely. Wild population status and fishery performance will continue to be assessed by the ODFW on an annual basis. The ODFW will conduct a comprehensive review of this plan after the 2004 fisheries to evaluate whether fisheries and wild populations are performing as expected. Comprehensive reviews will be repeated by the ODFW at 5-year intervals thereafter until such time as the wild stocks are recovered and delisted. Consultations between the ODFW and the NMFS regarding management of fisheries impacting listed CR chum will be reinitiated only if significant changes in the status or designation of CR chum, habitat conditions, management processes, or other unforeseen developments necessitate revision.

SECTION 4. CONSISTENCY OF FMEP WITH PLANS AND CONDITIONS SET WITHIN ANY FEDERAL COURT PROCEEDINGS

Actions and objectives contained in this proposed FMEP related to CR chum do not directly impact Federal tribal trust resources. There are no existing court orders with continuing jurisdiction over tribal harvest allocations that are relevant to the implementation of the proposed FMEP with respect to CR chum.

REFERENCES

Burgman, M. A., S. Ferson, and H. R. Akcakaya. 1993. Risk assessment in conservation biology. Chapman and Hall, London.

Johnson, O.W., W.S. Grant, R.G. Kope, K. Neely, F.W. Waknitz, and R.S. Waples. 1997. Status review of chum salmon from Washington, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-32.

Kostow, K. (editor). 1995. Biennial report on the status of wild fish in Oregon. Internal Report, Oregon Dept. of Fish and Wildlife, P.O. Box 59, Portland, OR 97207.

McElhany, P., M. H. Rucklelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. NOAA Technical Memorandum NMFS-NWFSC-42. Seattle, Washington.

Muldoon, A., J. Youngers, and E. Ollerenshaw. 2001. 2000 Lower Columbia River Chum Spawning Ground Survey Results. Oregon Department of Fish and Wildlife, Columbia River Management. Clackamas, Oregon.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grand, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-35, Seattle, Washington.

NMFS (National Marine Fisheries Service). 2000a. Biological opinion on effects of Pacific Coast ocean and Puget Sound fisheries during the 2000-2001 annual regulatory cycle. Seattle, Washington.

NMFS (National Marine Fisheries Service). 2000b. Biological opinion and incidental take statement on 2000 Treaty Indian and non-Indian fall season fisheries in the Columbia River Basin. Seattle, Washington.

ODFW and WDFW (Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife). 2000. Status Report. Columbia River Fish Runs and Fisheries, 1938-1999. Oregon Department of Fish and Wildlife, P.O. Box 59, Portland, OR 97207.

ODFW and WDFW (Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife). 2001. Section 7/10 assessment/application for the incidental take of listed species in Washington and Oregon mainstem fisheries of the Columbia River August through December, 2001. Oregon Department of Fish and Wildlife, P.O. Box 59, Portland, OR 97207.